UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 7,447,290 B2
APPLICATION NO. : 10/709,026
DATED : November 4, 2008
INVENTOR(S) : Yuan-Kun Hsiao

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

The title page showing the illustrative figure should be deleted to be replaced with the attached title page.

The drawing sheet, consisting of Fig. 2, should be deleted to be replaced with the drawing sheet, consisting of Fig. 2, as shown on the attached page.

PTO/SB/44 (09-07)
Approved for use through 08/31/2010. OMB 0651-0033
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

(Also Form PTO-1050)

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B2

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~~Page 1 of 1~~

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It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Drawings:

note

On Sheet 2 of 3, in FIG. 2, Box 42, line 1, delete "Filp-flop" and insert - - Flip-flop - -, therefor.

On Sheet 2 of 3, in FIG. 2, Box 44, line 1, delete "Filp-flop" and insert - - Flip-flop - -, therefor.

In column 2, line 43, after "addition," delete "A" and insert - - a - -, therefor.

In column 7, line 50, delete "to," and insert - - t0, - -, therefor.

In column 8, line 35, delete "t11," and insert - - t15, - -, therefor.

In column 9, line 10, delete "PS)" and insert - - P5) - -, therefor.

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(12) **United States Patent**
Hsiao

(10) **Patent No.: US 7,447,290 B2**
(45) **Date of Patent: Nov. 4, 2008**

(54) **APPARATUS OF PHASE-FREQUENCY DETECTOR**

(75) Inventor: **Yuan-Kun Hsiao**, Taipei Hsien (TW)

(73) Assignee: **Tian Holdings, LLC**, Wilmington, DE (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 830 days.

(21) Appl. No.: **10/709,026**

(22) Filed: **Apr. 7, 2004**

(65) **Prior Publication Data**

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Related U.S. Application Data

(60) Provisional application No. 60/461,578, filed on Apr. 10, 2003.

(51) **Int. Cl.**
H03D 3/24 (2006.01)

(52) **U.S. Cl.** **375/375**; 375/215; 375/371; 375/376; 327/3; 327/5; 327/7; 327/156; 369/44.13; 369/44.26

(58) **Field of Classification Search** 375/326, 375/362, 371, 373, 375–376, 315, 354; 327/113, 327/3, 5, 7, 12, 156; 455/130, 214; 369/44.13, 369/44.26, 44.28, 47, 275.4
See application file for complete search history.

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Assistant Examiner—Hirdepal Singh
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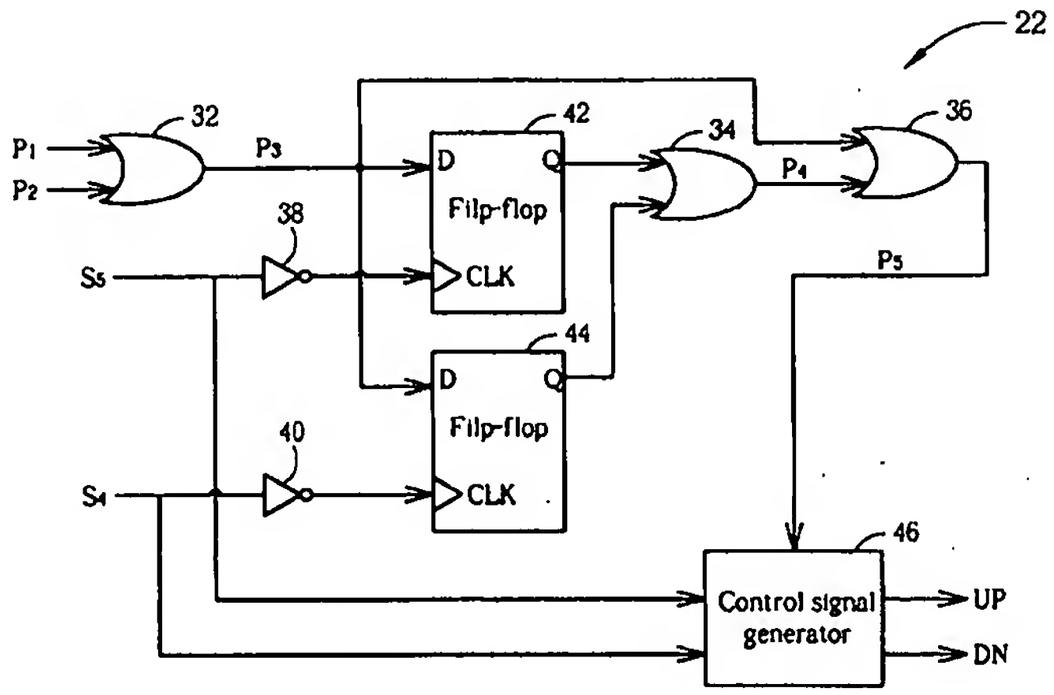
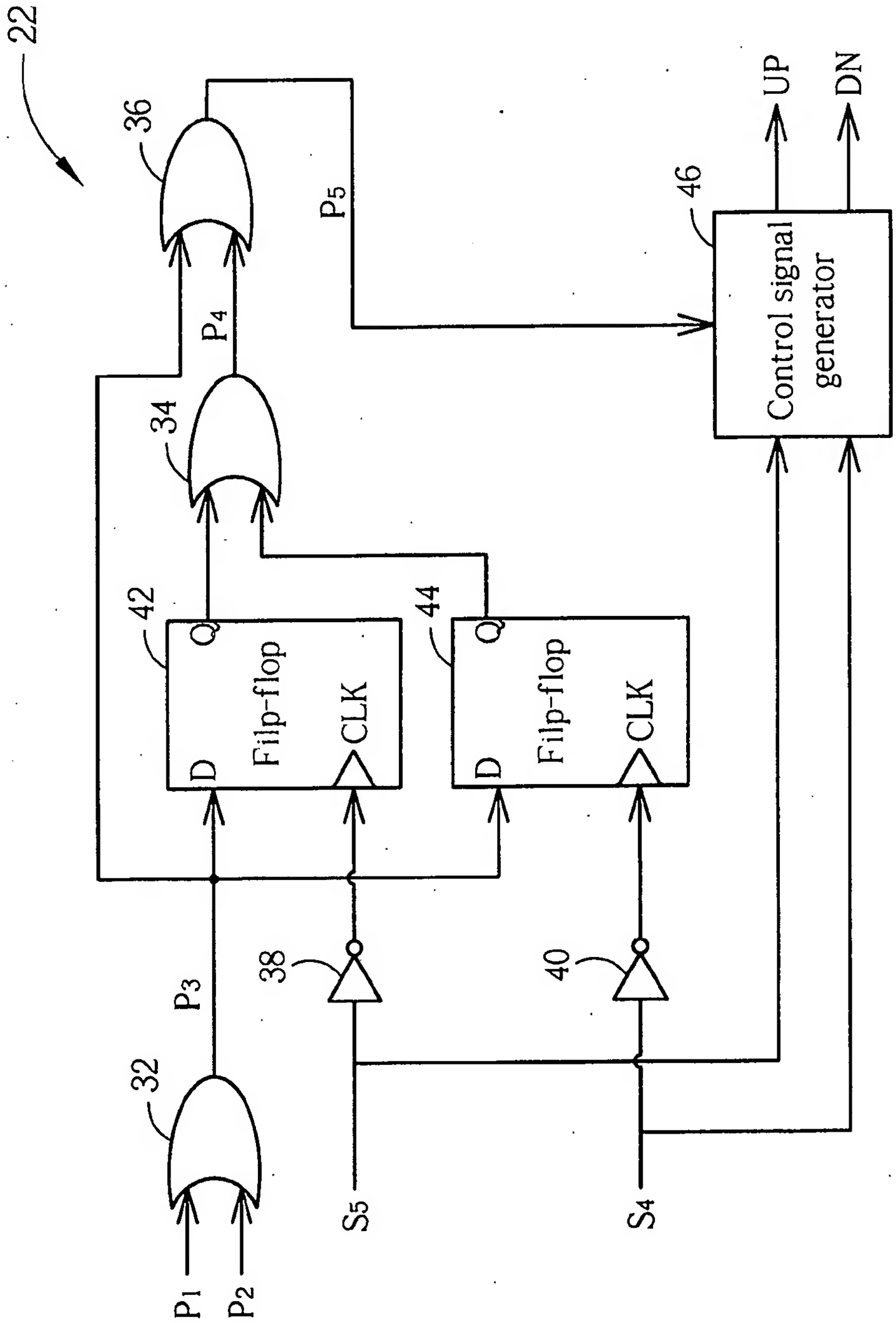
(57) **ABSTRACT**

An apparatus of phase-frequency detector for adjusting wobble clock signal and wobble signal in the same phase, comprising: a first logic gate, receiving a first protection signal and a second protection signal and outputting a third protection signal according to a logic operation; a first flip-flop, coupled to the first logic gate, outputting the third protection signal as a first output signal when the wobble clock trigger; a second flip-flop, coupled to the first logic gate, outputting the third protection signal as a second output signal when the wobble signal trigger; a second logic gate, coupled to the first and the second flip-flop, outputting a fourth protection signal according to a logic operation; a third logic gate, coupled to the second logic gate, receiving the third and the fourth protection signal, and outputting a fifth protection signal according to a logic operation; and a control signal generator, receiving the wobble clock, the input signal, and the fifth protection signal and determining whether adjusting the phase of the wobble signal and the wobble clock according to the logic level of the fifth protection signal.

21 Claims, 3 Drawing Sheets

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36
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P1
P2
P3
P4
P5
S4
S5
UP
DN
Control signal generator
Filp-flop
D
Q
CLK

Fig. 2